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ABSTRACT

In what is the only controlled experiment on the incentive value of letter grades in the university classroom, students were randomly assigned to 1 of 3 conditions: conventional letter-grading, pass-fail, or nonevaluation. During the semester in which the experiment was conducted, the pass-fail students studied only 50% as much and achieved 89% as many correct answers on hourly examinations as did the conventional group. Nonevaluated students studied only 13% as much and achieved 63% as many correct answers on the hourly examinations as did the conventional group. The examination performances of the nonevaluated group (for whom attendance was required) and of the pass-fail group were relatively quite a bit higher than the study time percentages, a fact largely attributed to overlapping content of text and lectures.
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EVALUATED AND NON-EVALUATED HIGHER EDUCATION[1]

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ABSTRACT

In what is (apparently) the only controlled experiment on the incentive value of letter grades in the university classroom, students were randomly assigned to one of three conditions: conventional letter-grading, pass-fail, or non-evaluation. During the term of the semester the pass-fail students studied only 50% as much and achieved 89% as many correct answers on hourly examinations as did the conventional group. Non-evaluated students studied only 13% as much and achieved 63% as many correct answers on the hourly examinations as did the conventional group. The examination performances of the non-evaluated group (for whom attendance was required) and of the pass-fail group were relatively quite a bit higher than the study time percentages, a fact largely attributed to overlapping contents of text and lectures.

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[1]Paper presented at 1972 meeting of the American Educational Research Association, Chicago. (April 7, 1972)

The last three years have seen vigorous assaults on the procedure of using grades to represent the degree of a student's academic achievement. Opponents of grading procedures have influenced a few academic programs into becoming totally non-evaluative, and they have succeeded at most institutions in bringing about the compromise of optionally recording only "pass" or "fail," They have accomplished this through a variety of intellectually arrived at arguments, all predicting success on the assumption of students' intrinsic motivation, but with a complete absence of data. Only occasionally do academicians express reservations about this trend, and some have even predicted that a few more years will bring about a new form of "traditional" education -- the totally open, non-evaluated program in American colleges and universities.

While academic personnel acquiesce, despite a great deal of unexpressed negative feeling about the trend (Stallings and Smock, 1971), the consumers of the academic product show increasing concern, as summarized in the lead editorial in the Wall Street Journal (October 21, 1970) titled "Debasing Higher Education."

> "In all the understandable concern over student violence, probably not enough public attention is being paid to another disturbing trend, the deterioration of academic standards on many campuses . . . A growing proportion of college students . . . are subject to fewer and fewer requirements and less and less evaluation than ever before. These developments seem to be less alarming since they are invariably presented under attractive slogans such as educational innovation, flexibility, responsiveness to student needs . . . If such trends continue, we can look forward to a disastrous increase in the number of unqualified degree holders who have gone through college largely untouched by any form of evaluation."

The opponents of grading have leveled a great deal of criticism against the conventional procedures, some of it undoubtedly deserved. Bramer (1970), for example, has stated that letter-grading is inevitably subjective to a degree, and he further points to the variability of grading both among schools and among teachers in a school. Yelon (1970) has pointed to the lack of specific information on performance in the simple recording of a letter grade, and has suggested a series of statements instead, programmed in such a way as to allow computer mediation of academic records.

On the other hand many criticisms are highly impressionistic and sometimes inflammatory. Simon (1970) states that "the grading system is the most destructive, demanding and pointless thing in education." He feels that grades are an "administrative convenience," which is their only justification. Becker (1968) has criticized grades for limiting the scope of students' interests and Priest (1971) feels students could "learn more" if not under the pressure of grades. Such remarks are made completely without benefit of data.

Most critics of conventional grading consider the pass-fail system[1] to be the most accessible remedy for the academic "pressures" which concern them. The pass-fail judgment is probably much older than its recent popularity might suggest, but it was in the late 60's that this system of dichotomous judgment came into common use. Its supporters are many, but their support is usually more philosophical than empirical. One or two spokesmen have rallied against the notion. Wunsch (1970) says "A pass-fail system can benefit only the mediocre student by putting him on the same level as the excellent one. Where all that matters is to pass or not to pass, there remains no incentive to excel." There has been some research into the question of whether students under a pass-fail system actually do demonstrate poorer performances, but each of the studies appears to have the limitation of self-selection into the pass-fail condition, which opens the question of equivalence of the compared groups. These studies have all indicated that pass-fail grading procedures produce a decline in the amount of material learned. At the University of Illinois, Stallings and Smock (1971) found that students enrolled in pass-fail would have averaged 0.7 of a grade point lower than regularly enrolled students if they had been given conventional grades. Similar findings were published by Karlins (1969) at Princeton University and by Syan (1970) at Brandeis. At Illinois State University, Mattingly (1971) produced data on 537 students enrolled in the basic

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[1]The term "pass-fail" is used here as a general term which may also refer to slight alterations such as pass-no report or pass-no credit.

Geography course, 44% of whom were enrolled on a pass-fail basis. If grades had been given to the pass-fail group, their average grade point in the course would have been only 1.65 (where A=4.0), which is 0.75 of a grade point below the graded students.

Critics of such studies insist that the mean ability level of self-selected pass-fail students is lower. There is some data to support such a claim. At the State University of New York in Cortland it was found that while academic achievement was lower for pass-fail enrolled freshman students, these students also had significantly lower overall grade point averages at the time compared with a control group, and when checked again as juniors they still had significantly lower GPAs (Gold, Reilly, Siberman, & Lehr, 1971). Critics insist that the "good" student will do as well under pass-fail or non-evaluated options as he would under a graded system, and on this point there appears to be no evidence. Occasionally one hears the remark that students in a pass-fail option or in a non-evaluated situation may concentrate more on "main points" and give less emphasis to the trivia that contribute heavily to hourly examinations. Up to now, however, there has been no actual research on the amount of time and effort put in on the course-work by students in such options.

METHOD AND SUBJECTS

The present experiment was designed to bring to light the effects, on both academic effort and academic achievement, of various evaluative procedures. Further, by equating ability level and certain motivational factors through the random assignment of subjects to conditions, the limitations of previous studies on the topic were overcome.

We began with a large auditorium group of 350 students enrolled in General Psychology. Subjects were randomly selected and randomly placed into one of three conditions if they met the criterion of being second semester freshmen. In the control condition, 31 students experienced traditional examination and grading

procedures and a resulting distribution of scores from A to F. The second condition placed 31 students into a typical pass-fail procedure where the requirement for a passing grade was a minimum D level of exam performance. Finally, 31 students were in a non-evaluated condition. Their requirement for a passing grade was attendance at a minimum of 75% of class sessions, and they had to take all seven hourly examinations. Their grades were posted with the others under student identification codes, but the examination scores were represented, for them, as intended only to give them information on their individual progress.

Being second semester freshmen, previous grade point averages were available for all 93 students. The means showed no significant differences:

Control	2.39
Pass-Fail	2.44
Non-evaluated	2.43

The seven examinations were of slightly different levels of difficulty and had some variation in numbers of items, so percentage scores on each examination were computed. These scores served as one criterion measure in the experiment. A two-way analysis of variance was conducted on these scores, with evaluative procedure the between factor and examinations the within factor.

A second criterion measure was represented in daily diaries of study time kept by the students and turned in weekly without identification other than the particular evaluation condition represented.

RESULTS

The mean percentage grades for the three groups over all seven examinations were as follows:

Control	77.2%
Pass-Fail	68.8%
Non-evaluated	48.8%

The main effects of evaluative procedure were significant ($p < .001$), with $F = 76.79$, where $F_{.999} = 7.76$ for $df = 2, 90$. Sheffe's follow-up test indicated that all

three pairwise comparisons between these means were significant beyond the .01 level. The interaction between evaluative procedures and examinations was not significant. An inspection of mean profiles across the seven examinations showed that overall that the same ordinal performance rankings of the three groups persisted for each examination, with the control group highest and the non-evaluated group lowest. It was concluded that in terms of class achievement, traditional evaluation procedures result in decisively higher performances than pass-fail evaluation, and overwhelmingly higher performances than non-evaluation.

The study diaries of the students were compared, and differences in the means of groups were even more vivid than was the case with examination performance. The average amount of time spent studying the course text and/or the class notes outside of class was calculated as follows:

Control:	149 minutes weekly
Pass-Fail:	75 minutes weekly
Non-evaluated:	19 minutes weekly

For purposes of easier comparison, the following table represents the performances on both criteria for the three groups using the percentage of the control group's mean as the absolute base.

Group	% Exam Achievement	% Time Studying
Control	(100.0)	(100.0)
Pass-fail	89.1	50.3
Non-evaluated	63.2	12.8

The results of this experiment clearly discount the notion that a given student will do as well under non-evaluative or pass-fail grading conditions as he would under conventional grading procedures. The notion that students under the radical procedures study main topics rather than "trivia" for examinations seems also to be more of a hopeful wish than a fact, in view of the finding that such students actually spend a great deal less time studying anything.

CONCLUSION

Relaxation of evaluative procedures appears to produce a considerable reduction in actual learning, at least at the freshman level in a university. The extrinsic motivation provided by a course grade, on the other hand, appears to have a powerful effect on the effort put forth and thereby upon the level of achievement. Educators dedicated to the pursuit of excellence should seriously question the advisability of initiating non-evaluated education or expanding present pass-fail programs.

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